Claims

Sub A97

1. A radio apparatus (50) comprising a diversity receiver which has
- a first reception branch (12; 40) and a second reception branch (13; 41),
- a RAKE receiver (14) comprising correlator branches (14a, 14b, 14c, 14d) for combining received signal components on baseband frequency, and
- a measuring receiver (14e; 16) for making measurements,
characterised in that it is arranged so as to tune the first reception branch (12; 40) to a different frequency than the second reception branch (13; 41) and to make measurements of a signal produced by one reception branch simultaneously with the reception of a signal produced by the other reception branch.

2. The radio apparatus of claim 1, **characterised** in that it comprises in a reception branch a switch (15; 31) which has at least two states (15a, 15b) in the first of which the switch is arranged so as to direct the signal received by said reception branch to said RAKE receiver (14) and in the second of which the switch is arranged so as to direct the signal received by said reception branch to said measuring receiver (14e; 16).

3. The radio apparatus of claim 2, **characterised** in that said reception branch comprises successively in the direction of the flow of the received signal
- an RF filter and amplifier (26),
- a first mixer (27) for IF conversion,
- an IF filter, and
- a second mixer (28) for baseband conversion,
so that said switch (15) is located after said second mixer in the direction of the flow of the received signal.

4. The radio apparatus of claim 2, **characterised** in that said reception branch comprises
- an RF filter and amplifier (26),
- a first mixer (32) for IF conversion,
- a first IF filter (34),
- a second mixer (34) for baseband conversion,
- a third mixer (33) for IF conversion,
- a second IF filter (35), and
- a fourth mixer (35) for baseband conversion,

so that said switch (31) is located between said RF filter and amplifier (26) on the one hand and said first mixer (32) and third mixer (33) on the other, and it is arranged so as to

- in a first state to conduct a signal from said RF filter and amplifier (26) via said first mixer (32), first IF filter (34) and second mixer (34) to said RAKE receiver (14) and
- in a second state to conduct a signal from said RF filter and amplifier (26) via said third mixer (33), second IF filter (35) and fourth mixer (35) to said measuring receiver (16).

5. The radio apparatus of claim 1, **characterised** in that it comprises an oscillator (44, 45) for each reception branch (40, 41) to produce the IF mixing frequency needed for the tuning of the reception branch.

6. The radio apparatus of claim 1, **characterised** in that it comprises a common oscillator (46) to produce the IF mixing frequencies needed for tuning all the reception branches as well as frequency conversion means (47, 48) to convert in each reception branch the frequency produced by said common oscillator to an IF mixing frequency suitable for tuning.

7. The radio apparatus of claim 1, **characterised** in that said RAKE receiver comprises a measuring block (14e) for measuring the impulse response of the received signals, and said measuring block can be repeatedly set so as to measure alternatively the signal produced by the first reception branch or the signal produced by the second reception branch.

8. A method for making frequency specific measurements in a diversity receiver which comprises at least two reception branches and which receives at a certain operating frequency, in which method to make measurements at other than the operating frequency, at least one reception branch is tuned (63) to other than the operating frequency and the signal received by it is directed (64) to a measuring receiver, **characterised** in that the tuning of at least one branch of the diversity receiver to other than the operating frequency is timed according to a certain predetermined timetable which is known to the transmitter apparatus transmitting at the operating frequency.

9. The method of claim 8, **characterised** in that a transmitter apparatus transmitting at the operating frequency is also requested (62) to transmit at a higher

power during the time that at least one branch of the diversity receiver is tuned to other than the operating frequency.

10. The method of claim 9, **characterised** in that a request for transmitting at a higher power is transmitted to said transmitter apparatus at a moment of time which is earlier by a certain delay length than the commencement of making the measurements at other than the operating frequency, said delay length corresponding to the previously estimated delay between a transmitted request for changing transmission power and the arrival at the receiver of the first transmission with the transmission power changed as per the request.

11. The method of claim 9, **characterised** in that a request for transmitting at a lower power is transmitted to said transmitter apparatus at a moment of time which is earlier by a certain delay length than the end of making the measurements at other than the operating frequency, said delay length corresponding to the previously estimated delay between a transmitted request for changing transmission power and the arrival at the receiver of the first transmission with the transmission power changed as per the request.

12. The method of claim 8, **characterised** in that said transmitter apparatus has various timetables concerning various terminals or groups of terminals.

13. The method of claim 8, **characterised** in that bit errors that occur in the reception while at least one branch of the diversity receiver is tuned to other than the operating frequency are corrected using interleaving in the signal received at the operating frequency.

14. The method of claim 8, **characterised** in that the tuning of at least one branch of the diversity receiver to other than the operating frequency is timed according to a timetable determined by the diversity receiver, the interval in the timetable between consecutive tunings of at least one branch of the diversity receiver to other than the operating frequency being inversely proportional to the relative received power, proportional to the received power at the operating frequency, on some or several other carriers.

15. A method for making frequency specific measurements in a diversity receiver which comprises at least two reception branches and a RAKE receiver including correlator branches and which receives at a certain operating frequency,

characterised in that to make measurements at other than the operating frequency, an impulse response measurement at the operating frequency carried out by a measuring block in the RAKE receiver is interrupted and said measuring block is set to carry out a measurement at other than the operating frequency.

16. A communications system (70) comprising base stations (71, 72) and terminals (76) of which at least one comprises a diversity receiver (77) which has at least two reception branches and a RAKE receiver including correlator branches to combine signals received by the different reception branches and which also has a measuring receiver to make measurements, **characterised** in that at least one terminal is arranged so as to tune the first reception branch (12; 40) to other frequencies than the second reception branch (13; 41) and to make measurements of both the signal produced by the first reception branch and the signal produced by the second reception branch, and the tuning of said first reception branch to other frequencies is timed according to a certain predetermined timetable which is known to at least one base station.